

March 2017

NSSC This Month

U.S. Army Garrison Natick Publications Office



Give 'Em the Boot

NSRDEC developing new
jungle footwear for Soldiers



2013 and 2015 U.S. Army
Maj. Gen. Keith L. Ware Awards
First Place, Digital Publication

NAGC

2016 National Association of
Government Communicators
First Place, External Newsletter



Commander's Corner

Brig. Gen. Anthony W. Potts
NSSC Senior Commander



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NSSC This Month

Time Is Running Out

We're getting closer and closer to opening day of the 2017 Major League Baseball season, and time is running out to register for an opportunity to join us for Team Natick Night at Fenway.

You can still register for an opportunity to purchase tickets at: <https://natick.armymwr.com/us/natick/programs/ticket-lottery>



You're cordially invited to join us for a dynamic opening day celebration at 2 p.m. Monday, April 3 at the Lord Community Center as the Red Sox begin their season against the Pittsburgh Pirates. A team of top chefs from the Civilian Welfare Fund committee will sell Fenway Franks throughout the afternoon as the game airs on televisions in the North End Lounge.

Between innings, MWR will announce the names of lucky contestants eligible to purchase tickets for the big game, scheduled for the evening of Friday, June 9 at Fenway Park.

Team Natick's triumphs are not confined to the baseball diamond. Steve Moody and Jeremy Whitsitt represented our Combat Feeding Directorate at the Association of the United States Army (AUSA) Global Force Symposium and Exposition with the skill of seasoned middle infielders. They ably demonstrated some of the outstanding innovations generated at Natick on behalf of our Soldiers and coalition partners.

Later this summer, we'll host representatives from the Canadian and German armies. The visit provides an ideal opportunity to showcase partnership efforts coming to fruition at Natick.

As some of you may know, global partnerships are a big part of my life. Among the most rewarding opportunities inherent in my role as Deputy Commanding General of the U.S. Army Research, Development and Engineering Command is the chance to personally visit facilities and witness fascinating developments across RDECOM. This includes vital international collaboration important to our mission. I've shared some pictures from significant engagements on my Facebook page if you'd like to experience some of the imagery: <https://www.facebook.com/BGAnthonyPotts/070552>

The goal of the social media effort is to provide Team Natick, as well as partners and supporters across the force, a window into our mission, our achievements and our vision. Your daily efforts, innovations and extraordinary products form the most compelling part of that story. Thank you for all the great things that you do on behalf of the Soldier – and let's go, Red Sox!

Brig. Gen. Anthony W. Potts
NSSC Senior Commander

NSSC This Month

NSSC
Senior Commander
[Brig. Gen. Anthony W. Potts](#)

Garrison Commander
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Command Sergeant Major
[Command Sgt. Maj. Michael R. Pintagro](#)

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About this newsletter
NSSC This Month is a monthly newsletter covering NSSC news within the Army and commercial media.

NSSC This Month is maintained by the USAG Natick Public Affairs Office.

To subscribe to *NSSC This Month*, please contact Bob Reinert at robert.j.reinert.civ@mail.mil.

On the Web: www.army.mil/natick

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NSSC News Briefs ...

Red Cross Blood Drive

The next scheduled blood drive is Friday, April 28, from 9 a.m. to 2 p.m. in the Lord Community Center. Walk-ins are accepted, but donors should plan to sign up in advance by visiting <https://esibelarecprod.redcrossblood.com/eevents/enu/start.swe?SWECmd=Start&SWEHo=esibelarecprod.redcrossblood.com>. If you have any questions, please contact our drive coordinator, Tim Brennan, at (508) 269-2321, or timothy.brennan@redcross.org.

NSSC Sharp Expo

Join us at Lord Community Center on Wednesday, April 12, from 9 to 11:30 a.m., or 1:30 to 3:30 p.m., for a new, interactive way to meet your annual online SHARP training requirement. Topics will include bystander intervention, consent, self-defense, and more. Contact Susan Baldwin at ext. 6925, or susan.o.baldwin.civ@mail.mil for more information.

NSSC Texas Hold 'Em

On April 13, MWR will be shuffling up its cards and dealing to you its first-ever Texas Hold 'Em event located at the Lord Community Center (Bldg. 32). This is a free event that promptly starts at 5 p.m. It doesn't matter if you are a "fish" or a "shark," all are welcome. Prizes will be given to the top three winners. Don't miss this royal flush opportunity. For more information, contact Bert Scott at ext. 4791, or at bert.r.scott4.naf@mail.mil.

Army Emergency Relief Campaign

Many thanks to all who made the Natick Chili Cook-Off and AER Campaign Kick-Off a success. If you missed it, don't worry, there is still time to donate to the AER Fund. Soldiers, retirees, civilians and contractors are welcome to donate to the annual campaign. Donations can be made by check, credit card, or, if you are active duty, you can initiate a pay allotment. Please contact your AER representative to get involved: for USARIEM – Maj. Amy Carlson at amy.m.carlson6.mil@mail.mil, 1st Lt. Robert Hugenberg at robert.s.hugenberg.mil@mail.mil, Staff Sgt. Karla Lopez at karla.v.lopez4.mil@mail.mil, or Sgt. Charina Hocog at charina.b.hocog.mil@mail.mil. For HRDD and all other units – Sgt. Vanessa Alvarado at vanessa.alvarado.mil@mail.mil. For civilians and general information – Diane Magrane at diane.k.magrane.civ@mail.mil.



Garrison Spotlight

Bert Scott IV

What Bert does:

"I am a supervisory recreation specialist for the Directorate of Family and Morale, Welfare and Recreation here at Natick. I am responsible for our Family and MWR's staffing and daily operations. Additionally, I plan, coordinate and execute programs and events to help boost the morale of the Natick workforce."



Family and MWR Director Joe Kurzontkowski on Bert:

"Bert leads the fitness, aquatics and recreation staffs to ensure the very best while working within exceedingly limited resources. From providing one-on-one customer service, to working behind the scenes on installation-

wide activities, Bert is involved in every aspect of Family and MWR service delivery, using logical but creative thinking to provide quality-of-life opportunities on and off the installation. Recently, Bert helped with coordination of the NSSC Commander's Cup competitions and the upcoming workforce outing at Fenway Park. He is a great asset to the team, and we are happy to have him on our team."

Join the CWF

The Civilian Welfare Fund is a group of volunteers from across the installation who meet on the first Wednesday of each month to plan and execute various activities on and off the installation for our NSSC workforce. We are currently looking for new members to be a part of our great organization. If you are curious about everything we do, and want more information, please join us for an informational meeting March 8, from 1:30-3 p.m., in Bldg. 3, room R-301. For more information, e-mail Duane Young at duane.l.young.civ@mail.mil.

MWR Closure

The Lord Community Activities Center (Bldg. 32) will be undergoing scheduled renovation work this spring and is expected to be closed from May 1 through July 4. For more information, please contact MWR at ext. 4791.



Focal Point

Fenway Oaths

Two Soldiers from the U.S. Army Research Institute of Environmental Medicine re-enlisted in March 17 ceremonies held at Fenway Park in Boston. They included Sgt. Sherrie Jansky, right, and Spc. Arturoeduardo Juarez, below right. Capt. Jeb Orr, USARIEM detachment commander, below left, administered the oath to both Soldiers.



Photos: Tazanyia Mouton, USAAG Natick Public Affairs

Full Court Press?

Considering the next Supreme Court justice

By Capt. Briana S. Tellado, NSSC Command Judge Advocate

Over the past several months, media sources and political pundits have had plenty to say about the process of selecting the next [Supreme Court](#) justice.



Justice Scalia

When [Justice Antonin Scalia](#) died suddenly in February 2016, many Democrats were adamant that President Obama to select Scalia's

replacement before he left office. Vocal Republicans, on the other hand, wanted to wait until after the presidential election to fill the vacancy. Republicans were hoping to elect a Republican president, who would likely nominate a conservative Supreme Court justice. Likewise, Democrats wanted their Democratic president to select someone who would likely lean to the liberal side.

The confirmation of the ninth Supreme Court justice is significant for several reasons. First, Supreme Court justices have tenure for life, which usually means they keep their jobs until they die in office. They don't usually resign or retire, giving someone else a chance to serve as a Supreme Court justice. So if you don't like the new justice, it's not like a presidential election, where you can say, "Oh, well, we'll have another chance in four years." You are stuck with the consequences of the Supreme

Court's rulings until other Supreme Court rulings overturn them.

Another practical result of nominating someone to fill the ninth chair is that you are essentially choosing a tiebreaker. When Scalia died, there were eight justices left on the bench – four conservative and four liberal. If the next justice is a conservative, then it's more likely that the next few years of Supreme Court decisions will rule in favor of conservatives. After all, a majority vote rules.

After President Trump nominated Neil Gorsuch as the ninth justice (unsurprisingly, a conservative), the [Senate Judiciary Committee](#) had the chance to question him before deciding whether to confirm him. This is a perfect example of our government's checks and balances, distributing power between the executive, judicial and legislative branches. News stations speculate how Gorsuch might vote on immigration, and whether he would enforce the President's travel restrictions. Feminist groups worry about how he would rule on women's issues, such as health care and abortion. Other popular topics include his stance on education, gun control, and campaign financing. And how does he feel about Russia? At this point, President Trump might be worried that the Senate won't confirm his pick.

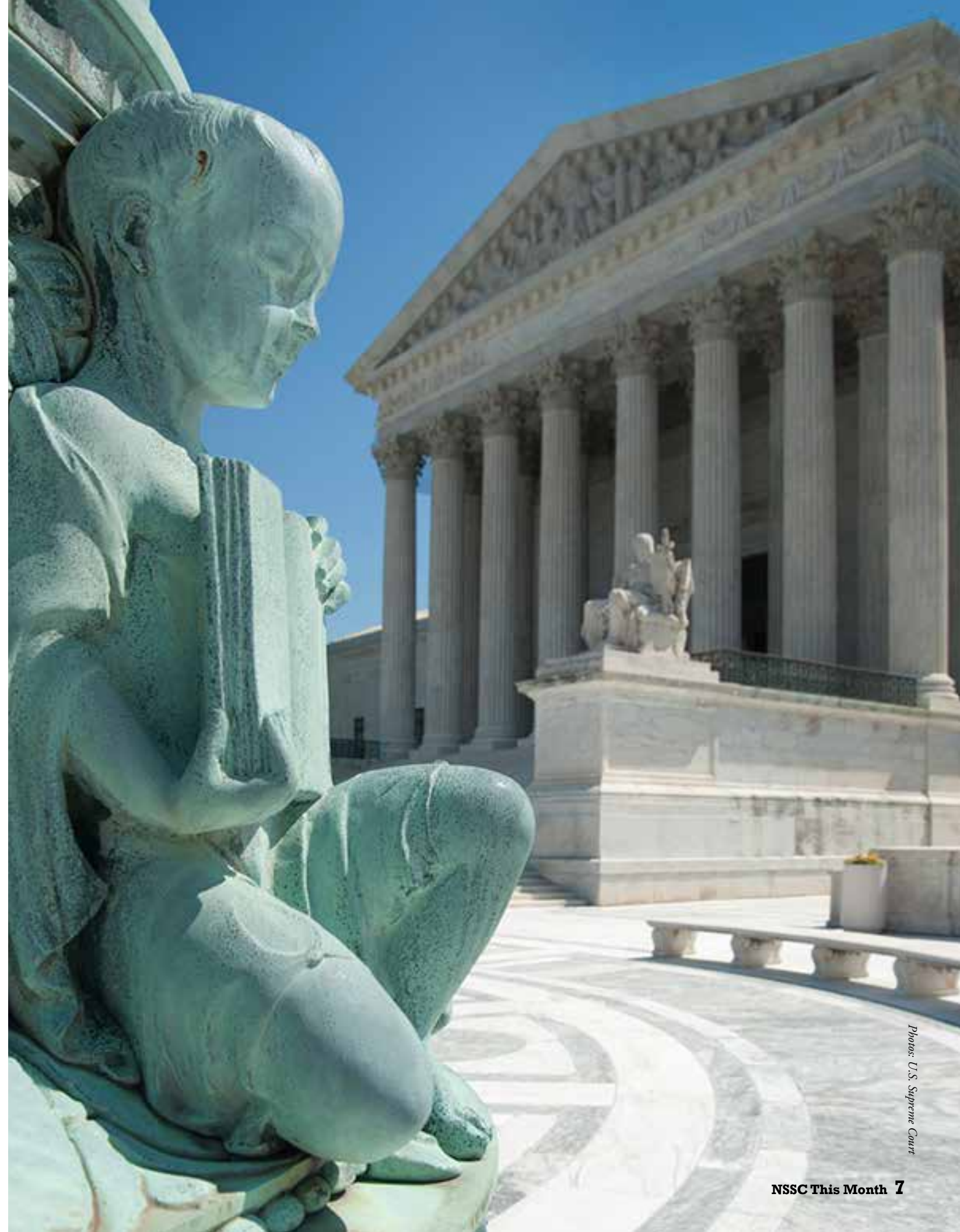
President Franklin Delano Roosevelt had a similar problem. Back in his day, FDR was trying to put the country back together after the Depression. He had a lot of social works programs to implement – they were all part of his

New Deal. By the end of 1935, FDR, a Democrat, was not getting much support from the Supreme Court. With a majority of Republican justices, the court had struck down 11 of his New

The confirmation of the ninth Supreme Court justice is significant for several reasons.

Deal initiatives. Roosevelt wanted to get these justices off the bench so he could replace them with Democrats, or he had to come up with a way to change the makeup of the Supreme Court so the Republicans would no longer form a majority.

When Roosevelt was re-elected in 1936, he put his plan into action. He proposed full retirement pay for any justice over the age of 70 who wanted to retire. If a Republican justice retired, FDR could select a Democrat to replace him. If an elderly justice was not inclined to take the bait, Roosevelt would appoint an "assistant," with a vote equal to all other justices, to help him. The total members of the Supreme Court would increase up to 15, allowing Roosevelt to pack it with as many voters as he needed to obtain a majority sympathetic to his reforms. Roosevelt's "court-packing plan" didn't pass the laugh test from Congress, and they rejected the bill. Nevertheless, because of the court's aging population, by the time Roosevelt died in 1945, the majority of justices were Roosevelt appointees.



Photos: U.S. Supreme Court



Jennifer Potts told those gathered March 27 for the Women's History Month observance at [Natick Soldier Systems Center](#) that she owed much to those trailblazers who had come before her in the Department of Defense.

From [Mary Ludwig Hays McCauley](#) in the Revolutionary War forward, American women have always found a way to serve their country during times of war. Contemporary women such as Potts, assistant product director, Acquisition for the Non-standard Rotary Wing Aircraft Project Office, [Program Executive Office Aviation](#) at Redstone Arsenal, Alabama, have built upon that sturdy foundation.

"All these women paved the way to give opportunities for women like me to serve in whatever capacity that we chose to," Potts said. "I'm honored by the fact that the path was paved in such a way that I'd have these opportunities."

Potts, wife of [Brig. Gen. Anthony W. Potts](#), NSSC senior commander, pointed out that there are currently 1.6 million U.S. women veterans and that more than 390,000 women serve in DoD, as service members and civilians. She joined the [Army Civilian Corps](#) seven years ago, but she has a total of 18 years of experience with Army aviation in program management, logistical and technical capacities.

"I never set out to do the things that I've done in my career," Potts said. "What I've always set out to do is just honestly do the things that were in service to our Army and that were fun. And along the way, I got to do some really, really cool things."

In her current position, she manages some \$500 million worth of equipment and services and has worked with numerous international partners.

"It's been a really cool job," Potts said. "I'm not going to lie. I've had the opportunity to see and do things I would never have dreamed of in my career."

Potts related that young women sometimes ask about her path to career success.

"Honestly, I didn't have a path," Potts confided. "I didn't go to go to (college) right out of high school. I didn't have the money. I didn't have the grades."

She eventually wound up working for Boeing, which paid for her to finish her bachelor's degree in night classes. After 9/11, she



Photo: John Harlow USAG Natick Public Affairs

Jennifer Potts, assistant product director, Acquisition for the Non-standard Rotary Wing Aircraft Project Office, Program Executive Office Aviation at Redstone Arsenal, Ala., spoke March 27 at NSSC's Women's History Month observance.

Trailblazers

Observance honors those who 'paved the way'

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (March 28, 2017)

wound up in the field as a logistics representative for the Apache attack helicopter.

"The theme of my career has always been 'just do what you want to do,'" Potts said. "My willingness to (seize) whatever opportunity was put before me was what kind of put me on the path to have the opportunities I have now."

She got married in 2005, took a sabbatical in 2006 to finish her graduate work, and became an Army civilian in 2010.

"The greatest honor I have," said Potts, "is that every day I get to serve the Army family."

Before stepping off the stage at Hunter Auditorium, Potts offered the workforce a little career advice.

"Don't be bounded by anything other than what you're willing to do," Potts said. "So, how I've gotten through life is the recognition that you don't take yourself too seriously, you have a good time, and you pick yourself up and you dust yourself off, and you move on to whatever's next if you fail."

"And then celebrate those things that are the awesome things, no matter how big or small they are."

Recognizing Innovation

FY16 Maj. Gen. Harold J. Greene Awards announced

By Brian Beall, AMC/REDSTONE ARSENAL, Ala. (March 13, 2017)

The [U.S. Army Materiel Command](#) announced the winners of the Fiscal Year 2016 Major General Harold J. Greene Award for Innovation at the [Association of the United States Army Global Force Symposium](#), March 14.

The FY16 Maj. Gen. Harold J. Greene Award for Innovation winners are:

- Individual-Civilian category: Dr. Ricky Massaro for the Tactical Full Motion Video-to-3D program, developed at the U.S. Army Corps of Engineers' Engineer Research and Development Center Geospatial Research Laboratory.
- Individual-Military category: 75th Ranger Regiment Command Surgeon Lt. Col. Ethan Miles, MD, for the Ranger O Low Titer Whole Blood Program.
- Group category: The development of the Advanced Kinetic Energy Cartridge by a team of nine Army civilians, led by Justin Rhodes at Army Materiel Command's Armament Research, Development and Engineering Center Munitions Engineering and Technology Center.

The winners' achievements provide the U.S. Army with valuable capability improvements to situational awareness, survivability, lethality and protection.

The individual-civilian winning submission, the Tactical Full Motion Video-to-3D program, provides deployed Soldiers with highly-detailed geospatial data delivered by manned and unmanned systems.

"Soldiers are no longer waiting for terrain or intelligence analysts to produce battlespace products," said Dr. Jeffery Holland, director of the Engineer Research and Development Center. "Dr. Massaro's technology puts these decision aids right at their fingertips with minimal training and effort."

The individual-military winning submission, the Ranger O Low Titer Whole Blood Program, was the result of a partnership



between the 75th Ranger Regiment at Fort Benning, Georgia, the U.S. Army Institute of Surgical Research and the Armed Services Blood Program (ASBP) to ensure all blood group O unit members are identified and tested to determine donors at the point of injury. Miles' program simplified the whole blood donation procedure for the 75th Ranger Regiment by working with the ASBP to draw units of O low titer whole blood from pre-identified personnel and deliver them to the senior medical personnel for storage at the forward operating base. The Ranger O Low Titer Whole Blood Program is the first of its kind to be used at the point of injury.

The group category winning submission, the Advanced Kinetic Energy Cartridge, also known as the M829A4, is a tank cartridge that improves upon existing kinetic energy tank cartridges by utilizing a depleted uranium penetrator and other design enhancements to provide superior lethality for the Army's Armored Brigade Combat Teams.

The Maj. Gen. Harold J. Greene Award for Innovation, under the Army's Greatest Innovation Awards Program (AGIAP), seeks to recognize the technological contributions of Army Soldiers and civilians that greatly enhance Army readiness and Soldier performance.

"It means the world to us to know the inspiration of Harry's hard work continues to contribute to making the Army and world a better place," said Dr. Susan Myers, Greene's widow. "He always tried to bring out the best in everyone. We are so glad to see how many folks are sharing how they enjoyed being part of the Greene team."

The Maj. Gen. Harold J. Greene Award for Innovation, under the Army's Greatest Innovation Awards Program (AGIAP), seeks to recognize the technological contributions of Army Soldiers and civilians that greatly enhance Army readiness and Soldier performance.



Give 'Em the Boot

NSRDEC developing new jungle footwear for Soldiers

By C. Todd Lopez, Army News Service/WASHINGTON (March 2, 2017)

The standard issue combat boot most Soldiers wear today, the one most commonly worn in Iraq and Afghanistan, is great for sandy dunes, hot dry weather, and asphalt. But it's proven not so good in hot and wet environments. So the Army has developed a new jungle boot that some Soldiers will see this year.

Last September, [Chief of Staff of the Army Gen. Mark A. Milley](#) directed the Army to come up with a plan to outfit two full brigade combat teams in Hawaii, part of the [25th Infantry Division](#) there, with a jungle boot. The Army had already been testing commercial jungle boots at the time – with mixed results – but didn't have a specialized jungle boot, so [Program Executive Office Soldier](#), headquartered at Fort Belvoir, Virginia, had to get a plan together to make it happen.

By October of last year, the Army had made a request to industry to find out what was possible, and by December, contracts were awarded to two boot manufacturers in the United States to build a little more than 36,700 jungle-ready combat boots – enough to outfit both full IBCTs in Hawaii.

"This is important to the Army, and important to Soldiers in a hot, high-humidity, high-moisture area," said Lt. Col. John Bryan, product manager for [Soldier Clothing and Individual Equipment](#), with PEO Soldier. "We are responding as quickly as we possibly can, with the best available, immediate capability, to get it on Soldiers' feet quickly, and then refine and improve as we go."

MIXING LEGACY WITH TECH

Right now, the new jungle boot the Army developed will be for Soldiers at the 25th ID in Hawaii – primarily because there



are actually jungles in Hawaii that Soldiers there must contend with. The new boots look remarkably similar to the current boots Soldiers wear – they are the same color, for instance. And the boots, which Bryan said are called the "Army Jungle Combat Boot" or "JCB" for short, sport a variety of features drawn from both the legacy M1966 Vietnam-era jungle boot and modern technology.

The M1966 Jungle Boot – which featured a green cotton fabric upper with a black leather toe that could be polished, had a solid rubber sole which Soldiers reportedly said had no shock-absorbing capability. The new boot uses a similar tread, or "outsole," as the M1966 "Panama style" – to shed mud, for instance, and provide great traction, but the added midsole is what makes it more comfortable and shock absorbing, said Albert Adams, who works at the [Army Natick Soldier Research, Development and Engineering Center](#).

The outsole of the new boot is connected to the leather upper via "direct attach," Adams said. That's a process where a kind of liquid foam is poured between the rubber outsole and leather boot upper. It's "a lot like an injection molding process," he said.

The foam layer between the rubber sole and the upper portion of the boot not only provides greater shock-absorbing capability, but he said it also keeps out microbes in hot, wet environments that in the past have been shown to eat away at the glues that held older boots together. So the new boots won't separate at the soles, he said. "It provides a high level of durability, and it also adds cushioning," he added.

Also part of the new boot is a textile layer that prevents foreign items from puncturing through the sole of the boot and hurting a Soldier's foot, Adam's said. The M1966 boot accomplished that with a steel plate. The new boot has a ballistic fabric-like layer instead.

Staff Sgt. Joshua Morse, an instructor at the Jungle Operations Training Center in Hawaii, said the puncture resistance is welcome. He said punji sticks, familiar to Vietnam War veterans, are still a problem for Soldiers, for instance.

"They use these punji pits for hunting purposes," he said. "In Brunei, you are literally in the middle of nowhere in this jungle, and there are natives that live in that area, and still hunt in that area, and it can be an issue." And in mangrove swamps, he said, "you can't see anything. You don't know what's under your feet at all. There are a lot of sharp objects in there, as well."

The new JCB also features a heel with a lower height than the M1966 model, to prevent snags on things like vines in a jungle environment. That prevents tripping and twisted ankles. Among other things, the boot also has additional drainage holes to let water out if it becomes completely soaked, speed laces so that Soldiers can don and doff the boots more quickly, a redesigned upper to make the boots less tight when they are new, an insert that helps improve water drainage, and a lining that makes the boot breathe better and dry faster than the old boot.

"You're going to be stepping in mud up to your knees or higher, and going across rivers regularly," Adams said. "So once the boot is soaked, we need it to be able to dry quickly, as well."

FEEDBACK FORMED FINAL DESIGN

Morse has already been wearing and evaluating early versions of the JCB and said he thinks the efforts made by the Army toward providing him with better footwear are spot on.

"The designs were conjured up in a lab somewhere, and they were brought out here, and the main focus was the field test with us," Morse said. "A lot of us have worn these boots for a year now, different variants of the boots. And all the feedback that we've put into this, and given to the companies, they have come back and given us better products every single time."

Morse said he hadn't initially worn the new jungle boots that he had been asked to evaluate. On a trip to Brunei, he recalled, he went instead with what he was familiar with and what he trusted – a pair of boots he'd worn many times, the kind worn by Soldiers in the deserts of Iraq and Afghanistan.

"I wore a pair of boots I'd had for a couple of years," he said. "I wore them in Brunei, and I had trench foot within a week. But then I thought – I have this brand new pair of test boots that they asked me to test; they are not broken in, but I'm going to give them a shot. I put them on. After 46 days soaking wet, non-stop, my feet were never completely dry. But I wore those boots, and I never had a problem again."

The Army didn't design the new JCB in a vacuum. Instead, it worked with Soldiers like Morse to get the requirements and design just right – to meet the needs of Soldiers, said Capt. Daniel Ferenczy, the assistant product manager for Soldier Clothing and Individual Equipment.

"We worked with Soldiers to come up with this boot. We take what Soldiers want and need, we boil that down to the salient

characteristics, hand that over to our science and technology up at Natick; they work with us and industry, the manufacturing base, to come up with this product," Ferenczy said. "This is a huge win, a great win story for the Army, because it was such a quick turnaround. Industry did a fantastic job. Our product engineers are also top of the line. And we had a ton of Soldier feedback ... We really dealt very closely with what the Soldier needs to get where we are."

In March, the Army will begin fielding the current iteration of the JCB to Soldiers in the first of two brigade combat teams in Hawaii. During that fielding, the boots will be available in sizes 7-12. In June, the Army will begin fielding the JCB to the second BCT – this time with a wider array of sizes available: sizes 3-16, in narrow, regular, wide and extra wide. They will also go back and take care of those Soldiers from the initial fielding who didn't get boots due to their size not being available. A third fielding in September will ensure that all Soldiers from the second fielding have boots. Each Soldier will get two pairs of JCBs.

In all, for this initial fielding – meant to meet the requirement laid out last September by the Army's chief of staff – more than 36,700 JCBs will be manufactured.

By December, the Army will return to Hawaii to ask Soldiers how those new boots are working out for them.

"Al Adams will lead a small group and go back to 25th ID, to conduct focus groups with the Soldiers who are wearing these boots and get their feedback – good and bad," said Scott A. Fernald, an acquisition technician with PEO Soldier. "From there, the determination will be made, if we had a product we are satisfied with, or if we need to go back and do some tweaking."

AUTHORIZED FOR ALL

Fernald said that sometime between April and June 2018, a final purchase description for the JCB will be developed – based on feedback from Soldiers who wore it. He said he expects that in fiscal year 2019, an indefinite delivery/indefinite quantity contract will be signed with multiple vendors to produce the final version of the JCB for the Army.

Bryan said the JCB, when it becomes widely available, will be wearable by all Soldiers who want to wear it – even if they don't work in a jungle.

"From the get-go we have worked with the G-1 ... to make sure we all understood the Army wear standards for boots," he said. "One of the pieces of feedback we have gotten from Soldiers before they wear them, is they look a lot like our current boots. That's by design. These will be authorized to wear."

While the JCB will be authorized for wear by any Soldier, Bryan made it clear that there will only be some Soldiers in some units who have the JCB issued to them. And right now, those decisions have not been made. For Soldiers who are not issued the JCB, if they want to wear it, they will need to find it and purchase it on their own.

"We are not directing commercial industry to sell them," Bryan said. "But if they build to the specification we've given them for our contract, they can sell them commercially and Soldiers are authorized to wear them."

Body of Work

USARIEM develops virtual X-rays of anatomic avatars

By Mallory Roussel, USARIEM Public Affairs/NATICK, Mass. (March 23, 2017)

Scientists from the [U.S. Army Research Institute of Environmental Medicine](#), or USARIEM, have been involved since 2010 in developing a computer program to create full-body, complete-anatomy avatars of individual warfighters, which would make an impact on military medicine throughout the U.S. Army.

They succeeded in making avatars a reality in 2016.

USARIEM researchers have now also developed computer software to create virtual X-ray images of their avatars, allowing them to better customize avatars to warfighters' physical makeup.

According to Dr. Gary Zientara, a mathematical modeler and avatar expert, this technology is the key to designing future software to produce avatars that best model individuals' body composition and internal anatomy, regardless of gender, shape or size.

"USARIEM's avatars are created by morphing standard, gender-specific anatomy figures to fit the body scans acquired from individuals," said Zientara, of USARIEM's [Biophysics and Biomedical Modeling Division](#), or BBMD.

"When creating avatars, the virtual X-ray software plays a special role. By simulating two whole-body X-rays acquired by using high-energy and low-energy rays, the software can compose a dual-energy X-ray absorptiometry, or DXA, scan. DXA scans are a common and useful research tool at USARIEM, as well as other clinical medical centers and research sites, because they can take a comprehensive snapshot of a person's exact breakdown of bone, fat tissue and muscle mass. For USARIEM's avatar software, information from DXA scans can aid in managing Soldier nutrition requirements, directly contributing to Soldier readiness."

When X-rays interact with muscle, fat, organs and bones, they collide with many atoms along the way. With denser tissues like bone, the X-ray transfers all of its energy to the matter and it gets absorbed. That is why bones are easier to see in X-rays. Softer organ tissue only absorbs some of the X-ray energy, and the rest is scattered. That is what ends up producing the 2-D X-ray photographs of our bones, with denser organs like lungs and muscles darkening the film.

According to Zientara, the virtual X-ray software is able to replicate the actions of an X-ray by knowing the X-ray energy, the distance X-rays travel through various tissues and how much the X-ray beam is absorbed or scattered as it goes through

organs and bones. Besides 2-D X-ray photographs, however, Zientara can also sample the virtual X-ray software data from different angles of the body, creating computed tomography, or CT, scans from the avatars.

"The ability to compute CT scans from avatars opens new state-of-the-art medical applications the Army could use in the field," Zientara said. "While X-rays are good for observing bone, we can use CT scans to take detailed pictures of the body from multiple angles in order to study soft tissues in the body, such as the brain, liver or abdominal organs. In a field hospital setting, for example, surgeons could use CT scans of avatars to study what is hidden beneath the flesh and tissue of the patient."

USARIEM's BBMD is working with Professor Steven Heymsfield from the [Pennington Biomedical Research Center](#) at [Louisiana State University](#) to further enhance USARIEM's avatar software. Using Heymsfield's data collected from body scans and DXA scans of hundreds of adult volunteer subjects, Zientara can modify the avatar internal anatomy so there are fewer differences between actual DXA scans and DXA scans computed from USARIEM's virtual X-ray software.

"USARIEM's avatars are currently created at a lower spatial resolution," Zientara said. "This can lead to minor distortions in the avatar body scans, compared to the photographic quality X-rays we may remember if we have had a broken bone in the past."

To solve this problem, Zientara is hoping to transfer the avatars to a supercomputer at the Department of Defense High Performance Computing Center. The higher resolution of a supercomputer would allow Zientara to create avatars that better model the shapes and contents of body anatomy.

USARIEM is capable of constructing male avatars, with hundreds already made. While the current software can morph standard anatomy into a body scan to create an avatar for any person, Zientara is working on developing software to accommodate female, gender-specific anatomy to construct female avatars.

"Simulating medical imaging using the avatars not only aids USARIEM's avatar development, but it also demonstrates the principle clearly and visually that the avatars can be employed for a wide range of Army simulation studies, reducing risk, costs and implementation time compared to the past," Zientara said.

Scientists from the U.S. Army Research Institute of Environmental Medicine, or USARIEM, have developed virtual X-ray images of avatars, like the two dual-energy X-ray absorptiometry scans pictured, to better customize avatars to warfighters' physical makeup.



Photo illustration: Mallory Roussel, USARIEM Public Affairs

Feeling Their Pain

Natick artist working on second activity book for veterans

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (March 23, 2017)

Having undergone four surgeries in five years and endured plenty of physical rehabilitation, Steve Russell knows what it's like to be a veteran attempting to get back to normal.

The 58-year-old Russell has dealt with nerve-related problems in his neck, both wrists and his right elbow. He also has heart issues.

"The pain still is there," said Russell, a Navy veteran and now an illustrator with the Soldier-Product Support Integration Directorate at [Natick Soldier Systems Center](#). "Some things, you just live with."

Russell has always had compassion for other veterans. In late 2011, he and a number of other volunteers collaborated to produce the "[Heroes Activity Book](#)," a 29-page, 11x17-inch therapeutic publication filled with illustrations, word searches, other brain teasers and associated stories meant to entertain, challenge and occupy veterans and their families.

Thousands of copies were printed and distributed to veterans' organizations and other groups around the nation. They provided Russell with a great deal of positive feedback.

"I think part of the welcome acceptance of it was that it was fine-tuned (for veterans) and it was tuned to families," Russell said. "Originally, it was meant to go for the Wounded Warrior Project and for the Fisher House here. I think that was the 'wow' factor for me, is that it was designed locally and it just kind of (spread)."

Buoyed by the response, Russell began planning a second volume of the publication.

"I had started the second book, and then I ran into my own (physical) problems, which became one after the other," said Russell, adding that they reminded him of "my own needs as a vet."

Russell finally feels well enough to start on volume two. Currently, he's asking for volunteers to come forward and contribute ideas, stories or artwork.



"Mainly, it's trying to help people understand what it is that I'm doing," Russell said. "You don't have to have professional art. You don't have to have professional writing."

As Russell pointed out, the first book contained much more than just information about Natick and the military.

"There were flowers in there. There were hearts in there," Russell said. "You just have to have (a topic) that relates to somebody's interest."

There can even be teamwork, said Russell, who told of "Pie in the Sky," an illustration that he did five years ago about the tube food developed at Natick for U-2 pilots on long flights. A former U-2 pilot and his daughter are writing a story to go with Russell's illustration.

"I think the hardest part is (getting) people committed to doing (this project)," Russell said. "Talk is nice, but I need action."

Russell wants to move forward with the second volume and hopes to have it completed for veterans and their families by this time next year. Its pages will include a good deal of information about veterans' organizations.

"There's a ... focus on organizations that help veterans," Russell said. "This way, when the books are in the hands of those convalescing, or even for their families, they'll have (other resources) to look into that might spark their interests."

The first volume has found a permanent home on the "Military Kids Connect" website. It can be downloaded at <http://militarykidsconnect.dcoe.mil/tweens/coping/projects/>.

For more information about the "Heroes Activity Book," contact Steve Russell at stephen.e.russell8.civ@mail.mil.

Steve Russell displays two of the illustrations that will appear in the second volume of the "Heroes Activity Book," for veterans and their families.



Photo: David Kamm, NSRDEC Strategic Communications



TRADOC Command Gen. David Perkins addresses Class 67 in the Cooper Lecture Center at the U.S. Army Sergeants Major Academy. NSRDEC and USARIEM are working with Curriculum Development and Education at the USASMA to help revise wide-ranging curriculum for the Soldier. Opposite, Soldiers attend the Master Leader Pilot class.

Photos: David B. Crozier, Command Communications, U.S. Sergeants Major Academy



NSRDEC

British philosopher, statesman and scientist [Sir Francis Bacon](#) once said, “knowledge itself is power,” an adage that especially applies to the American Soldier. With that idea in mind, the [U.S. Army Natick Soldier Research, Development and Engineering Center](#) and the [U.S. Army Research Institute of Environmental Medicine](#) are working with curriculum development and education at the [U.S. Army Sergeants Major Academy](#), or USASMA, to help revise wide-ranging curriculum for the Soldier.

By revising Professional Military Education, or PME, NSRDEC, USARIEM and USASMA’s curriculum department seek to move away from instructor-led ways of learning to experiential ways of learning that focus on student participation, collaboration, experiences and involvement. Passive instruction, or instructor-led learning, typically does not engage learners or build on prior experience in the way that experiential learning does. Experiential learning is also more apt to address the needs of the individual learner and includes problem-solving exercises that are relevant to the Soldier’s working environment.

“Experiential learning has proven to be one of the most effective ways of transferring retainable knowledge to adult students,” said William R. Ogletree, chief of curriculum development and education at USASMA.

By working together, NSRDEC, USARIEM and USASMA’s curriculum development and education aim to improve learning techniques and ways of thinking, increase knowledge retention and improve channels for Soldiers to pass along knowledge to other Soldiers. The resulting knowledge pool would then be frequently updated to ensure that Soldiers have the latest and best information.

The collaboration will eventually include an NSRDEC-hosted site that will house applicable science and technology knowledge products, which USASMA curriculum developers can use to access needed information and course content.

“NSRDEC and USARIEM has already greatly assisted us by reviewing and providing input into our educational products, rubrics and other curriculum materials for delivery in the classrooms,” said Ogletree.

USASMA’s curriculum development and education oversees all Non-commissioned Officer Education System courses and is responsible for all educational content, both self-directed and classroom, for all enlisted Soldiers. The USASMA curriculum encompasses a wide variety of topics relevant to the Soldier.

“Our knowledge is really in curriculum analysis, design, development and execution for 16 different courses,” said Ogletree. “Those courses include, but are not limited to, the Basic Leader Course, Advanced Leader Course (Common Core), Senior Leader Course (Common Core), Master Leader Course, Sergeants Major Course, Structured Self-Development Course level 1-6, Battle Staff NCO Course, and the Commandant’s Pre-Command Course.”

Ogletree emphasized the importance of the collaboration.

“The collaboration between the USASMA and NSRDEC/USARIEM will benefit the Soldiers by providing them with the latest and greatest information available as it comes out,” said Ogletree. “When NSRDEC and USARIEM put out new info, I can get it immediately into the appropriate level courses – BLC, ALC, SLC, MLC or the SMC. This provides the student and leader with the most current and relevant information to take back to their units. It also assists NSRDEC and USARIEM with a vehicle to distribute their products and information. This is a vital link that has been vacant for many, many years.”

NSRDEC and USARIEM are particularly well suited to improving the Soldier’s access to knowledge and how this knowledge is presented. NSRDEC and USARIEM have long been experts in studying Soldier performance and ways to optimize performance and improve quality of life.

“NSRDEC and USARIEM are uniquely positioned to share knowledge products with the USASMA curriculum developers because our respective missions are to conduct and transition Soldier-centric research,” said Elizabeth Caruso, NSRDEC Human Performance Thrust Area manager.



“USARIEM is very excited to have the opportunity to partner with the USASMA curriculum developers,” said Dr. Stephen Muza, deputy, Science and Technology Management, USARIEM. “We see the insertion of our knowledge products into the USASMA enlisted and NCO PME as a highly effective way to educate Army leadership on best practices and guidance for sustaining Soldier health and performance across the full spectrum of Army training and operations.”

Scott Germain, team leader, NSRDEC Soldier/Squad Interface Team, is the operational liaison between NSRDEC and USASMA’s curriculum developers.

“Soldiers benefit from this collaboration because they will be getting the most up-to-date, evidence-based information embedded in their education, enhanced by subject matter experts and presented in a way to improve Soldier knowledge/training retention,” said Germain. “In turn, Soldiers can then apply that knowledge within their unit.”

In addition to working with the academy, NSRDEC has ongoing partnerships with several units to garner new insights into the cognitive, physical and emotional performance of Soldiers.

“We’ve seen the demand come from the units as to what types of information Soldiers need and are hungry for,” said Rick Haddad, assistant deputy chief of staff, G3/5. “That created an opportunity to engage the chief of curriculum at the Sergeants Major Academy. At NSRDEC, we are out there talking to Soldiers. We know what they want and need for information. And now we’ve built this bridge to the institutional Army where we can feed that PME design over and over again with new and relevant information and products.”

“NSRDEC generates large amounts of knowledge,” said Haddad. “Now, we have a clear path to transition this knowledge to the institutional Army, which has a great reach.”

Knowledge Is Power

NSRDEC, USARIEM to help Sergeants Major Academy with curriculum

By Jane Benson, NSRDEC Public Affairs/NATICK, Mass. (March 13, 2017)



By the Bootstrap

Natick's initiative pulls up great ideas

By Jane Benson, NSRDEC Public Affairs/NATICK, Mass. (March 16, 2017)

Through the Bootstrap Initiative and Pitch Day, the [Natick Soldier Research, Development and Engineering Center](#), or NSRDEC, has come up with an ingenious way to encourage out-of-the-box thinking, promote risk-taking and enable employee participation.

NSRDEC's Dr. Ken Desabrais, a research aerospace engineer, conceived the Bootstrap Initiative, implemented to encourage innovation and creativity while streamlining processes and minimizing bureaucracy. Through the program, government civilian NSRDEC employees are allowed to submit proposals for a new technology, research project, business process or administrative process that supports NSRDEC's science and technology, or S&T, mission, including researching and developing cutting-edge food, shelter, clothing and airdrop technologies and products.

"The Bootstrap Initiative was conceived of as a way to bring the crowdsourcing concept to NSRDEC to find innovative and creative ways within our organization to solve a spectrum of problems, from technical challenges to improvements in our business and administrative processes and tools," said Desabrais. "Our intent with the initiative was to encourage the sharing of ideas and help nurture a culture of collaboration amongst our colleagues to identify and find solutions to the problems we see in achieving our mission of helping the Soldier, while also empowering people to pursue and make decisions about those ideas."

"Bootstrap is an engaging way for people throughout the organization to get to know each other better, which leads to more productive collaborations," said Dr. Charlene Mello, NSRDEC's chief scientist.

This year's proposals ranged from the development of cut-and-puncture-resistant material to an extreme weather fabric test apparatus to nonstick dishes that can be cleaned without water – to name a few innovative proposals.

Frank Murphy's Bootstrap 2017 proposal was for an ultrasonic device for advanced composite construction. Murphy is a mechanical engineer on NSRDEC's Tactical Shelters Team, which is

currently developing shelters that utilize resin composite materials in either hybrid or full composite construction systems.

"The ultrasonic test equipment provides a portable, robust, reliable and accurate means of flaw detection in composite construction geometries and can also identify failure modes within the composite that are not readily apparent to visual inspection," said Murphy.

Murphy noted the importance of the Bootstrap Initiative.

"We find that the Bootstrap program can help foster solutions to technology challenges that are uncovered as we adopt new material solutions to address the evolving demands of the Warfighter," said Murphy.

Alfredo Lujan is a clothing designer on NSRDEC's Design Pattern and Prototype team. His proposal, "We are not squares," discusses the ben-

efits of using Kinetic Garment Construction, or KGC, to design military clothing. KGC moves away from more traditional pattern making that assumes a static upright body toward patterns that provide greater range of motion and wrap ergonomically around the body and follow the body's movements.

"Bootstrap encourages innovation by allowing folks to develop, pitch and secure funding for ideas or equipment that may not be directly tied to a project but would be beneficial to the Warfighter and NSRDEC accomplishing their mission," said Lujan. "It's a quick and effective way to get an idea off the ground. As someone who is still fairly new to NSRDEC, being able to pitch was a great opportunity to network with folks from around the installation. I was able to get valuable feedback on my project and presentation. It gave me a little more insight on the needs and considerations of different departments."

"We have some incredibly creative people in our organization who often identify innovation opportunities while at their desk, in the lab or even in the car," said Mello. "Their inspiration comes from spending time with Soldiers, the emergence of new technological advances or their innate curiosity and desire for enhanced understanding. The Bootstrap program gives them an avenue to present these ideas, refine and improve them based

upon input from their peers and quickly explore the value of said idea."

"The ideas submitted through the Bootstrap innovation program are not typically the kind of efforts that get funded through traditional channels," said Tom Merle, NSRDEC's chief innovation officer. "These are passion-driven ideas that people have come up with, but they don't have any financial means or recognized time to pursue them. What we've found is that these modest investments to build, try or learn more about an idea have often led to outcomes that impact the Soldiers even in the short term and have frequently been the catalyst to enable follow-on funding to keep advancing the idea. This program has served to energize and empower the S&T community by giving them an opportunity to 'sell' the potential of an idea, build excitement and support from their colleagues and then with enough support pursue the idea they believe will help our Soldiers and help us execute our mission more effectively."

NSRDEC's Bootstrap Initiative not only gives employees the chance to propose ideas, they also have the chance to vote on which ideas receive funding. Pitch Day is a key part of this process. During Pitch Day, proposers are given the chance to garner employee voter support for their ideas by making posters, displaying prototypes, creating interactive displays and conducting show-and-tell sessions.

"I personally think this is one of the more important programs that we sponsor here," said Deb Anderson, who oversaw the execution of Bootstrap Pitch Day. "I love the excitement and creativity it generates. In times of austere S&T budgets and future uncertainty, Bootstrap is a morale booster. Networking and camaraderie are in full effect. It's the 'Mighty Mouse' effect, as far as I'm concerned – a whole lot of punch for a pretty small amount of money."

Although Bootstrap is intended to reduce red tape and encourage innovation, there are still some submission restrictions. For instance, ideas must be able to be carried out for \$50,000 or less. Funding cannot be used to fund a contractor or external contract.

The 2016 Bootstrap Initiative had many success stories including the Body Armor Firing Solution, or BAFS. The BAFS is comprised of nylon hook straps and pile connecting areas, with non-skid fabric reinforced with nylon inner fabric and rifle butt stop.



Bootstrap Initiative and Pitch Day at Natick Soldier Research, Development and Engineering Center encourages out-of-the-box thinking and promotes risk-taking and employee participation.

BAFS prevents the rifle butt from slipping off an individual's firing shoulder.

"The BAFS was a great success for me and my team because we were able to briefly experience the birth of a great idea, pursue that idea, generate a material solution and introduce that solution to active-duty Soldiers serving now," said Col. Charles H. May, NSRDEC's military deputy.

For Bootstrap 2017, 18 out of 28 proposals were chosen to receive funding. For the first time in Bootstrap history, two ideas received 100 percent of the requested funding based on voter support. These projects were NSRDEC G3/5 Operations Center, submitted by Kristen Ryan, and RFID (Radio-Frequency Identification) Inventory Tracking, submitted by Patrick Benasutti and Colleen Ottomano.

It should be noted that even ideas that were not chosen still help to make the workforce aware of potential ideas for innovations in the future.

Voters also had the chance to vote on the "Best of the Best" or "People's Choice" from Bootstrap's 2016's winners, with NSRDEC's John Ramsay and Jonathan Kaplan winning first place for the highly successful Low Cost Airborne Soldier Load Assistance Device.

"There is a strong push to increase the rate of innovation in the [DoD](#), and this program has proven to enable just that," said Merle.

Protecting Soldiers

TEP System takes the load off

By C.Todd Lopez, Army News Service/WASHINGTON (March 16, 2017)

The average Generation II Improved Outer Tactical Vest weighs about 26 pounds. But the new “Torso and Extremity Protection System” or TEP, under development now at [Program Executive Office Soldier](#), sheds about five pounds of weight and also adds a wide degree of scalability that commanders can make use of depending on threat level and mission.

The TEP is part of the new “Soldier Protection System” under development now at PEO Soldier. The SPS includes both the TEP and the Integrated Head Protection System.

The TEP can replace the IOTV, at less weight and greater scalability, depending on the mission. It includes the “Modular Scalable Vest,” the “Ballistic Combat Shirt,” the “Blast Pelvic Protection System,” and a “Battle Belt,” which is aimed at getting weight off a Soldier’s shoulders and onto the hips.

With the TEP, commanders can require Soldiers to go with full protection – which provides the same level of protection as a fully-loaded IOTV – or go all the way down to wearing soft armor under their uniforms for missions that require less protection.

“It’s about giving commanders on the battlefield the ability to use the modularity capability of the equipment to fit their particular mission profile or protective posture level,” said Lt. Col. Kathy Brown, the product manager for [Personal Protective Equipment](#) at PEO Soldier, [Fort Belvoir](#), Virginia.

The IOTV sometimes required Soldiers to wear the Deltoid Auxiliary Protection – cumbersome parts that snapped onto the IOTV and protected their shoulders. Soldiers might have also been asked

to wear the smaller, easily lost collars that also snapped onto the IOTV. Both are gone with the TEP. They’ve been replaced by the Ballistic Combat Shirt, which is a shirt with breathable fabric and which also includes those smaller ballistic protection parts built in. Soldiers would wear the BCS under the TEP’s Modular Scalable Vest.

“We have tested it,” Brown said of the Ballistic Combat Shirt. “Soldiers like it. There is 95-percent Soldier acceptability of it. What we are working on now is tweaking the sizes.”

The TEP also includes the Blast Pelvic Protection System, which is designed to protect a Soldier’s thighs and groin against ballistic threats and burns. The BPPS is meant to replace the current combination of the pelvic undergarment and the pelvic outer-garment, or “PUG” and “POG.” The PUG has sometimes been referred to as “ballistic underwear.”

Brown said the BPPS “provides the same level of protection” as the PUG and POG combined, including both burn and fragment protection. She said Soldiers have reported that it feels more like it is “part of the pants.”

The “Battle Belt” included with the TEP is part of a weight management system, but it also offers some protection, as well.

“It’s designed to remove the weight from your shoulders and put it on your hips,” Brown said. Whereas Soldiers might strap a radio or other gear onto their IOTV in the past, the Battle Belt can now take that gear and move the weight onto a Soldier’s hips.

Brown said that after successful ballistic testing, production of the TEP will begin in probably May of this year, and that Soldiers could see it in 2018 or 2019.

Another part of the Soldier Protection System is the Integrated Head Protection System, or IHPS. In its full configuration, it looks similar to a motorcycle helmet.

The IHPS consists of a base helmet, similar to the polyethylene “Enhanced Combat Helmet” that some Soldiers are already wearing. The IHPS also includes add-ons for the base helmet, including a visor, a “mandible” portion that protects the lower jaw, and a “Ballistic Applique” that is much like a protective layer that attaches over the base helmet. The complete ensemble is known as the “high threat configuration.”

Brown said that eventually all deploying Soldiers will get the IHPS with the base helmet, which is the standard configuration. Other Soldiers – vehicle gunners, in particular – will also get the mandible portion and the ballistic applique, as well – known as the turret configuration.

The IHPS currently has a Picatinny rail mounted on the side for attaching gear, and will also provide for attaching head-mounted night vision goggles.

The visor portion on the IHPS provides ballistic protection to a Soldier’s face but doesn’t provide any protection against the sun. So Soldiers wearing it will need to wear darkened sunglasses underneath the visor if they are in bright environments.

Maj. Jaun F. Carleton, also with PEO Solider, had a pair of new sunglasses that are authorized for use by Soldiers if they want to buy them, or if their commanders buy them for them.

The sunglasses, which also come in a face mask version, as well, start off clear – offering no protection against the sun. But with the press of a button, LCD modules that adhere to the lenses darken and provide protection against the sun. That happens in less than a second.

“The benefit is that using one pair of protective eyewear, you wouldn’t have to switch from a clear goggle to a dark goggle – you’d have one protective eyewear for all conditions,” Carleton said.

Brown said the goggles will be available for units to be able to requisition as part of the Soldier Protection System.

“If we are able to drive the price down, the Army could eventually make a decision to include that on the list of items that we carry for deploying Soldiers,” Brown said.

Brown said the IHPS will likely be available to deploying Soldiers sometime between 2020 and 2021.

As part of extensive human factors evaluations, Brown said that PEO Soldier has used Soldiers extensively to evaluate the new gear.

“We had a massive scale of Soldiers to evaluate the equipment, usually over a three-week to month-long timeframe, where they would perform their different mission sets, where they will execute basic rifle marksmanship and ruck marches,” she said.

Afterward, she said, those same Soldiers were asked what they think of the gear through a qualitative evaluation methodology (Soldier survey).

“They would give us the good, the bad, the ugly,” Brown said. “It’s extremely important to get Soldiers’ input. First,

Soldiers are brutally honest, and they are going to tell you exactly how they feel about the equipment. Second, why buy equipment Soldiers won’t wear? And third, who’s better to give us the best answer about how the kit should be designed than the Soldier who will actually wear the equipment?”



Photo: C. Todd Lopez, Army News Service

The Torso and Extremity Protection System” or TEP, under development now at Program Executive Office Soldier, sheds about five pounds of weight from the IOTV, and also adds a wide degree of scalability that commanders can make use of depending on threat level and mission.

Science Works!

USARIEM featured on new television program

By Mallory Roussel, USARIEM Public Affairs/NATICK, Mass. (March 6, 2017)

The [U.S. Army Research Institute of Environmental Medicine](#), or USARIEM, whose mission is to optimize warfighter health and performance through military medical research, was featured in the new TV program “[Science Works!](#),” which aired at 8 a.m. Feb. 24 on the [Science Channel](#).

Dr. Rebecca Fellin, a biomechanical engineer from USARIEM’s [Military Performance Division](#), or MPD, was filmed in January in the Center for Military Biomechanics Research at [Natick Soldier Systems Center](#), or NSSC, in Massachusetts.

“I was glad to share some of my research with ‘Science Works!,”’ Fellin said. “It is important for USARIEM to tell the story of our scientific research to kids and adults in an engaging way for them to know there are numerous scientific research opportunities in the military, not just for Soldiers but also civilians.”

In the Center for Military Biomechanics Research, Fellin took television viewers behind the scenes of Army science to showcase the technology USARIEM researchers use to improve performance and prevent injury in warfighters.

Onscreen, USARIEM’s Spc. Alexis Gonzalez, equipped in female body armor (developed at NSSC) and wearing reflective, spherical markers on her body, walked along the center’s treadmill. Underneath the treadmill, “fancy bathroom scales, or force plates,” as Fellin described, detected the force going through Gonzalez’s body. Multiple cameras surrounding the treadmill captured Gonzalez’s movements by tracking the reflective markers on her knees, feet, waist and shoulders.

With this technology, USARIEM researchers see where and how Soldiers’ bodies move, while wearing different types of body armor and performing easy to hard work. According to Fellin,



Dr. Rebecca Fellin, center, a biomechanical engineer from the U.S. Army Research Institute of Environmental Medicine, or USARIEM, takes Noelle Lara Horelik, the host of the new Science Channel TV program “Science Works!” on a tour through the Center for Military Biomechanics Research to demonstrate to younger viewers how she uses math and science every day in her injury research for warfighters.

biomechanics can not only be used in sports to measure performance and exercise, but it can also be used by USARIEM for injury research.

“Biomechanics can help understand causes of injuries, which in turn, can be used to help prevent

injuries,” Fellin said. “By decreasing the rate of injuries, Soldier readiness improves.”

“Science Works!” is a “virtual field trip” that brings students and lifelong learners of all ages behind the scenes of some of the most interesting Science, Technology, Engineering and Math, or [STEM](#), careers, vividly affirming that math and science are not just for the classroom.

USARIEM’s mission is to optimize Soldier health and performance through medical research, in part by developing guidance for military leadership, to prevent performance decrements and musculoskeletal injuries and build and sustain a healthy and resilient force.

“Army science is a fun and exciting field,” Fellin said. “We have a chance to see the results of our research that have a meaningful impact on our warfighters.”

Find the Science Channel on channels 82, 141 and 1265 on Spectrum (formerly Bright House Networks). It is available on channel 193 on Dish Network, 284 on DirecTV, and 258 and 1258 on AT&T U-verse.

Chilean Visit

Brig. Gen. Anthony W. Potts, deputy commanding general of RDECOM and senior commander of Natick Soldier Systems Center, discusses potential collaboration opportunities with Col. Jose Riquelme of Military Geographic Institute, which is the official, technical service for the Chilean government on cartography and national terrain in different scales and formats. Here, they examine the Digital Sand Box project, which allows one to view real-time interactions happening in the virtual sand box.





Holocaust Remembrance Day

April 24, 2017

**Wall of Remembrance,
U.S. National
Holocaust Museum,
Washington, D.C.**

*Photographs in the Carol M. Highsmith
Archive, Library of Congress, Prints and
Photographs Division*